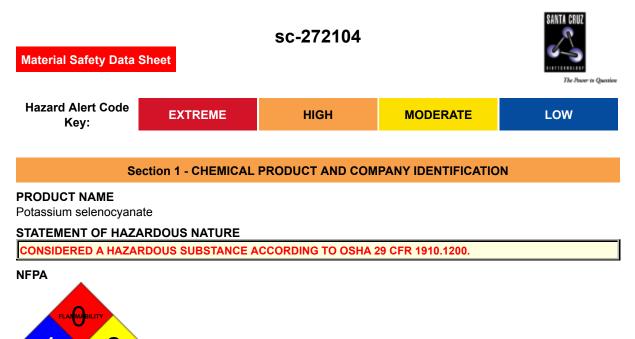
Potassium selenocyanate

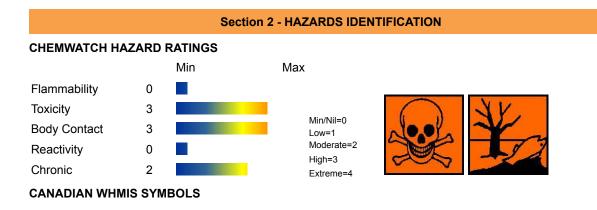


SUPPLIER

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SYNONYMS

K•SeCN, C-K-Se, KSeCN, "selenocyanic acid, potassium salt"





EMERGENCY OVERVIEW RISK

Contact with acids liberates very toxic gas. Danger of cumulative effects. Toxic by inhalation, in contact with skin and if swallowed. Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

POTENTIAL HEALTH EFFECTS

ACUTE HEALTH EFFECTS

SWALLOWED

■ Toxic effects may result from the accidental ingestion of the material; animal experiments indicate that ingestion of less than 40 gram may be fatal or may produce serious damage to the health of the individual.

■ Cyanide poisoning can cause increased saliva output, nausea without vomiting, anxiety, confusion, vertigo, dizziness, stiffness of the lower jaw, convulsions, spasm, paralysis, coma and irregular heartbeat, and stimulation of breathing followed by failure.

Often the skin becomes cyanosed (blue-grey), and this is often delayed.

■ Acute effects of selenium poisoning include nervousness, convulsions, drowsiness, frontal headaches, and in extreme cases, death from respiratory depression.

There may also be skin eruptions, tiredness, stomach upset, discolouration of teeth, an odorous garlic breath and loss of hair and nails.

EYE

Although the material is not thought to be an irritant (as classified by EC Directives), direct contact with the eye may cause transient discomfort characterised by tearing or conjunctival redness (as with windburn). Slight abrasive damage may also result.

SKIN

Skin contact with the material may produce toxic effects; systemic effects may result following absorption.

There is some evidence to suggest that this material can cause inflammation of the skin on contact in some persons.

- Skin contact with cyanides may cause an itchy rash with blisters and scabs which may become infected.
- Open cuts, abraded or irritated skin should not be exposed to this material.

■ Entry into the blood-stream, through, for example, cuts, abrasions or lesions, may produce systemic injury with harmful effects.

Examine the skin prior to the use of the material and ensure that any external damage is suitably protected. **INHALED**

■ Inhalation of dusts, generated by the material, during the course of normal handling, may produce toxic effects.

The material is not thought to produce respiratory irritation (as classified by EC Directives using animal models).

Nevertheless inhalation of dusts, or fumes, especially for prolonged periods, may produce respiratory discomfort and occasionally, distress.

■ Persons with impaired respiratory function, airway diseases and conditions such as emphysema or chronic bronchitis, may incur further disability if excessive concentrations of particulate are inhaled.

If prior damage to the circulatory or nervous systems has occurred or if kidney damage has been sustained, proper screenings should be conducted on individuals who may be exposed to further risk if handling and use of the material result in excessive exposures.

CHRONIC HEALTH EFFECTS

■ Substance accumulation, in the human body, is likely and may cause some concern following repeated or long-term occupational exposure.

Long term exposure to high dust concentrations may cause changes in lung function i.e. pneumoconiosis; caused by particles less than 0.5 micron penetrating and remaining in the lung. Prime symptom is breathlessness; lung shadows show on X-ray.

Chronic exposure to cyanides and certain nitriles may result in interference to iodine uptake by thyroid gland and its consequent enlargement. This occurs following metabolic conversion of the cyanide moiety to thiocyanate.

Thyroid insufficiency may also occur as a result of metabolic conversion of cyanides to the corresponding thiocyanate. Exposure to small amounts of cyanide compounds over long periods are reported to cause loss of appetite, headache, weakness, nausea, dizziness, abdominal pain, changes in taste and smell, muscle cramps, weight loss, flushing of the face, persistent runny nose and irritation of the upper respiratory tract and eyes. These symptoms are not specific to cyanide exposure and therefore the existence of a chronic cyanide toxicity remains speculative. Repeated minor contact with cyanides produce a characteristic rash with itching, papules (small, superficial raised spots on the skin) and possible sensitisation. Concerns have been expressed that low-level, long term exposures may result in damage to the nerves of the eye.

Chronic exposure to selenium and its compounds irritate the bronchi, cause gastrointestinal problems, irritation of the nasopharynx and a persistent foul garlic breath. There is often a metallic taste, pallor, irritability, extreme tiredness after years of exposure. Occasionally kidney and liver damage can occur. Selenium can cause tooth decay.

Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS				
NAME	CAS RN	%		
potassium selenocyanate	3425-46-5	>98		

Section 4 - FIRST AID MEASURES

SWALLOWED

IMPORTANT ESTABLISH A FIRST AID PLAN BEFORE WORKING WITH CYANIDES. ANTIDOTES SHOULD BE AVAILABLE ON SITE.

- Prompt response in an emergency is vital.
- All workers are to be trained and refresher trained in procedures.
- For cyanide poisonings by any route
- Contact Poisons Advisory Centre or a doctor.
- Seek immediate medical attention.
- Place casualty in coma position.
- Give oxygen when available.

EYE

If this product comes in contact with the eyes

- Immediately hold eyelids apart and flush the eye continuously with running water.
- Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids.
- Continue flushing until advised to stop by the Poisons Information Centre or a doctor, or for at least 15 minutes.
- Transport to hospital or doctor without delay.

SKIN

If skin or hair contact occurs

- Quickly but gently, wipe material off skin with a dry, clean cloth.
- Immediately remove all contaminated clothing, including footwear.
- Wash skin and hair with running water. Continue flushing with water until advised to stop by the Poisons Information Centre.
- Transport to hospital, or doctor.

INHALED

- If fumes or combustion products are inhaled remove from contaminated area.
- Lay patient down. Keep warm and rested.
- Prostheses such as false teeth, which may block airway, should be removed, where possible, prior to initiating first aid procedures.
- Apply artificial respiration if not breathing, preferably with a demand valve resuscitator, bag-valve mask device, or pocket mask as trained. Perform CPR if necessary.

NOTES TO PHYSICIAN

- For cyanide intoxication (and for certain nitriles which produce cyanide ion)
- Signs symptoms of acute cyanide poisoning reflect cellular hypoxia and are often non-specific.
- Cyanosis may be a late finding.
- A bradycardic, hypertensive and tachypneic patient suggests poisoning especially if CNS and cardiovascular depression subsequently occurs.
- Immediate attention should be directed towards assisted ventilation, administration of 100% oxygen, insertion of intravenous lines and institution of cardiac monitoring.
- Selenium dusts produce respiratory tract irritation, manifested by nasal discharge, loss of smell, epistaxis, and cough. Consumption of selenites and to a lesser degree, selenates causes nausea, vomiting, abdominal pain and tremor which resolves in 24 hrs. Muscle tenderness, tremor, light-headedness and facial flushing are observed in selenite poisoning.
- Both the acid and elemental form are well absorbed through the lungs and gastro-intestinal tract. Elimination (mostly in the urine) results in a biological half-life of around 1.2 days.
- Chronic selenium poisoning resembles arsenic poisoning. Management of chronic intoxication is supportive with elimination of the selenium source. BAL and CaNa2EDTA may enhance toxicity.
- High dose vitamin C (several grams daily) has produced equivocal results. This is probably reasonable as in-vitro results indicate selenium salts are then reduced to poorly absorbed elemental selenium.

Management of chronic selenium intoxication is supportive with elimination of the selenium source. BAL (dimercaprol, 2,3-dimercaptopropanol) and CaNa2EDTA may enhance toxicity.

There are no antidotes to selenious acid toxicity; treatment is expectant (cardiopulmonary monitoring in an intensive care setting) and supportive (intravenous infusion, supplemental oxygen and ventilation as needed).

Section 5 - FIRE FIGHTING MEASURES

Vapor Pressure (mmHG)	Negligible
Upper Explosive Limit (%)	Not available.
Specific Gravity (water=1)	2.347
Lower Explosive Limit (%)	Not available

EXTINGUISHING MEDIA

for inorganic cyanides

- DO NOT USE CARBON DIOXIDE as reaction may produce hydrogen cyanide
- Extinguish fires with water spray or fog; reaction may produce hydrogen cyanide exhibit extreme caution
- Do NOT use straight stream of water
- Most foams will react with inorganic cyanides and release toxic and corrosive fumes.

FIRE FIGHTING

- Alert Fire Brigade and tell them location and nature of hazard.
- Wear full body protective clothing with breathing apparatus.
- Prevent, by any means available, spillage from entering drains or water course.
- Use fire fighting procedures suitable for surrounding area.

When any large container (including road and rail tankers) is involved in a fire, consider evacuation by 800 metres in all directions.

GENERAL FIRE HAZARDS/HAZARDOUS COMBUSTIBLE PRODUCTS

- Non combustible.
- Not considered a significant fire risk, however containers may burn.

Decomposition may produce toxic fumes of nitrogen oxides (NOx), metal oxides. May emit poisonous fumes.

FIRE INCOMPATIBILITY

None known.

Section 6 - ACCIDENTAL RELEASE MEASURES

MINOR SPILLS

- Clean up waste regularly and abnormal spills immediately.
- Avoid breathing dust and contact with skin and eyes.
- Wear protective clothing, gloves, safety glasses and dust respirator.
- Use dry clean up procedures and avoid generating dust.

MAJOR SPILLS

- Clear area of personnel and move upwind.
- Alert Fire Brigade and tell them location and nature of hazard.
- Wear full body protective clothing with breathing apparatus.
- Prevent, by any means available, spillage from entering drains or water course.

Section 7 - HANDLING AND STORAGE

PROCEDURE FOR HANDLING

- Avoid all personal contact, including inhalation.
- Wear protective clothing when risk of exposure occurs.
- Use in a well-ventilated area.
- Prevent concentration in hollows and sumps.

RECOMMENDED STORAGE METHODS

- Lined metal can, lined metal pail/ can.
- Plastic pail.
- Polyliner drum.
- Packing as recommended by manufacturer.

For low viscosity materials

- Drums and jerricans must be of the non-removable head type.
- Where a can is to be used as an inner package, the can must have a screwed enclosure.
- <. All inner and sole packagings for substances that have been assigned to Packaging Groups I or II on the basis

of inhalation toxicity criteria, must be hermetically sealed. **STORAGE REQUIREMENTS**

- Store in original containers.
- Keep containers securely sealed.
- Store in a cool, dry, well-ventilated area.
- Store away from incompatible materials and foodstuff containers.

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE CONTROLS

Source	Material	TWA ppm	TWA mg/m³	-	STEL mg/m³		TWA F/CC	Notes
Canada - British Columbia Occupational Exposure Limits	potassium selenocyanate (Selenium and compounds, as Se)		0.1					
US - Minnesota Permissible Exposure Limits (PELs)	potassium selenocyanate (Selenium compounds (as Se))		0.2					
US OSHA Permissible Exposure Levels (PELs) - Table Z1	potassium selenocyanate (Selenium compounds (as Se))		0.2					

	potassium		
Canada - Alberta Occupational Exposure Limits	selenocyanate (Selenium and compounds, as Se)	0.2	
US - Vermont Permissible Exposure Limits Table Z-1-A Transitional Limits for Air Contaminants	potassium selenocyanate (Selenium compounds (as Se))	0.2	
US - Vermont Permissible Exposure Limits Table Z-1-A Final Rule Limits for Air Contaminants	potassium selenocyanate (Selenium compounds (as Se))	0.2	
US - Idaho - Limits for Air Contaminants	potassium selenocyanate (Selenium compounds (as Se))	0.2	
US - Tennessee Occupational Exposure Limits - Limits For Air Contaminants	potassium selenocyanate (Selenium compounds (as Se))	0.2	
Canada - Quebec Permissible Exposure Values for Airborne Contaminants (English)	potassium selenocyanate (Selenium and compounds (as Se))	0.2	
Canada - Saskatchewan Occupational Health and Safety Regulations - Contamination Limits	potassium selenocyanate (Selenium and compounds, (as Se))	0.2	0.6
US - Hawaii Air Contaminant Limits	potassium selenocyanate (Selenium compounds (as Se))	0.2	
Canada - Yukon Permissible Concentrations for Airborne Contaminant Substances	potassium selenocyanate (Selenium - compounds (as Se))	0.2 -	0.2
US - Washington Permissible exposure limits of air contaminants	potassium selenocyanate (Selenium compounds (as Se))	0.2	0.6
Canada - Northwest Territories Occupational Exposure Limits (English)	potassium selenocyanate (Selenium compounds (as	0.2	0.6

	Se))		
Canada - Nova Scotia Occupational Exposure Limits	potassium selenocyanate (Selenium - Compounds (as Se))	0.2	TLV Basis eye & upper respiratory tract irritation
US - Alaska Limits for Air Contaminants	potassium selenocyanate (Selenium compounds (as Se))	0.2	
US - Michigan Exposure Limits for Air Contaminants	potassium selenocyanate (Selenium compounds (as Se))	0.2	
US - California Permissible Exposure Limits for Chemical Contaminants	potassium selenocyanate (Selenium compounds, as Se)	0.2	
US - Wyoming Toxic and Hazardous Substances Table Z1 Limits for Air Contaminants	potassium selenocyanate (Selenium compounds (as Se))	0.2	
US - Oregon Permissible Exposure Limits (Z-1)	potassium selenocyanate (Selenium - compounds (as Se))	0.2	

PERSONAL PROTECTION



RESPIRATOR

• Type A-P Filter of sufficient capacity. (AS/NZS 1716 & 1715, EN 1432000 & 1492001, ANSI Z88 or national equivalent)

EYE

- Safety glasses with side shields.
- Chemical goggles.
- Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate irritants. A written policy document, describing the wearing of lens or restrictions on use, should be created for each workplace or task. This should include a review of lens absorption and adsorption for the class of chemicals in use and an account of injury experience. Medical and first-aid personnel should be trained in their removal and suitable equipment should be readily available. In the event of chemical exposure, begin eye irrigation immediately and remove contact lens as soon as practicable. Lens should be removed at the first signs of eye redness or irritation lens should be removed in a clean environment only after workers have washed hands thoroughly. [CDC NIOSH Current Intelligence Bulletin 59], [AS/NZS 1336 or national equivalent]

HANDS/FEET

- Wear chemical protective gloves, eg. PVC.
- · Wear safety footwear or safety gumboots, eg. Rubber

Suitability and durability of glove type is dependent on usage. Important factors in the selection of gloves include

- frequency and duration of contact,
- chemical resistance of glove material,
- glove thickness and
- dexterity
- OTHER
- Overalls.
- Eyewash unit.
- Barrier cream.
- Skin cleansing cream.

ENGINEERING CONTROLS

■ Engineering controls are used to remove a hazard or place a barrier between the worker and the hazard. Well-designed engineering controls can be highly effective in protecting workers and will typically be independent of worker interactions to provide this high level of protection.

The basic types of engineering controls are

Process controls which involve changing the way a job activity or process is done to reduce the risk.

Enclosure and/or isolation of emission source which keeps a selected hazard "physically" away from the worker and ventilation that strategically "adds" and "removes" air in the work environment.

Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL PROPERTIES

Solid.

Mixes with water.

Contact with acids liberates very toxic gas.

State	Divided solid	Molecular Weight	144.08
Melting Range (°F)	212 (decomp)	Viscosity	Not Applicable
Boiling Range (°F)	Not available	Solubility in water (g/L)	Miscible
Flash Point (°F)	Not available	pH (1% solution)	Not available
Decomposition Temp (°F)	Not Available	pH (as supplied)	Not applicable
Autoignition Temp (°F)	Not available	Vapor Pressure (mmHG)	Negligible
Upper Explosive Limit (%)	Not available.	Specific Gravity (water=1)	2.347
Lower Explosive Limit (%)	Not available	Relative Vapor Density (air=1)	>1
Volatile Component (%vol)	Negligible	Evaporation Rate	Not applicable

APPEARANCE

Powder with garlic-like odor; mixes with water.

Section 10 - CHEMICAL STABILITY

CONDITIONS CONTRIBUTING TO INSTABILITY

- Presence of incompatible materials.
- Product is considered stable.
- Hazardous polymerisation will not occur.

STORAGE INCOMPATIBILITY

- Contact with acids produces toxic fumes
- Metal cyanides are readily oxidised and those of some heavy metals show thermal instability.

- Metal cyanide and cyanates are often endothermic, Several members of this family of compounds, containing heavy metals tend to explosive instability, and most are capable of violent oxidation under certain circumstances.
- Fusion of mixtures of metal cyanides with metal chlorates, perchlorates, nitrates or nitrites cause violent explosion.
- Magnesium reacts with incandescence on heating with several metal cyanides; release of cyanogen by thermal decomposition may cause vigorous reaction with magnesium.
- Metals and their oxides or salts may react violently with chlorine trifluoride and bromine trifluoride.
- These trifluorides are hypergolic oxidisers. They ignites on contact (without external source of heat or ignition) with recognised fuels - contact with these materials, following an ambient or slightly elevated temperature, is often violent and may produce ignition.
- The state of subdivision may affect the results.

For incompatible materials - refer to Section 7 - Handling and Storage.

Section 11 - TOXICOLOGICAL INFORMATION

potassium selenocyanate

TOXICITY AND IRRITATION

• No significant acute toxicological data identified in literature search.

CARCINOGEN

Selenium and selenium compounds	International Agency for Research on Cancer (IARC) - Agents Reviewed by the IARC Monographs	Group	3
Selenium and Compounds	US EPA Carcinogens Listing	Carcinogenicity	D
potassium selenocyanate	US ACGIH Threshold Limit Values (TLV) - Carcinogens	Carcinogen Category	D
potassium selenocyanate	US - Rhode Island Hazardous Substance List	IARC	
SELENIUM COMPOUNDS	US Environmental Defense Scorecard Suspected Carcinogens	Reference(s)	EPA-HEN
potassium selenocyanate	US - Maine Chemicals of High Concern List	Carcinogen	D

Section 12 - ECOLOGICAL INFORMATION

Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

This material and its container must be disposed of as hazardous waste.

Avoid release to the environment.

Refer to special instructions/ safety data sheets.

Ecotoxicity

Ingredient	Persistence: Water/Soil	Persistence: Air	Bioaccumulation	Mobility
potassium selenocyanate	No Data Available	No Data Available		

Section 13 - DISPOSAL CONSIDERATIONS

US EPA Waste Number & Descriptions

A. General Product Information

Reactivity characteristic: use EPA hazardous waste number D003 (waste code R).

Toxicity characteristic: use EPA hazardous waste number D010 (waste code E) if this substance, in a solid waste,

produces an extract containing greater than 1 mg/L of selenium.

Disposal Instructions

All waste must be handled in accordance with local, state and federal regulations.

- Containers may still present a chemical hazard/ danger when empty.
- Return to supplier for reuse/ recycling if possible.

Otherwise:

- If container can not be cleaned sufficiently well to ensure that residuals do not remain or if the container cannot be used to store the same product, then puncture containers, to prevent re-use, and bury at an authorised landfill.
- Where possible retain label warnings and MSDS and observe all notices pertaining to the product.

Legislation addressing waste disposal requirements may differ by country, state and/ or territory. Each user must refer to laws operating in their area. In some areas, certain wastes must be tracked.

A Hierarchy of Controls seems to be common - the user should investigate:

- Reduction
- Reuse
- Recycling
- Disposal (if all else fails)

This material may be recycled if unused, or if it has not been contaminated so as to make it unsuitable for its intended use. Shelf life considerations should also be applied in making decisions of this type. Note that properties of a material may change in use, and recycling or reuse may not always be appropriate. In most instances the supplier of the material should be consulted.

- DO NOT allow wash water from cleaning or process equipment to enter drains.
- It may be necessary to collect all wash water for treatment before disposal.
- In all cases disposal to sewer may be subject to local laws and regulations and these should be considered first.
- Where in doubt contact the responsible authority.
- Care must be taken when using hypochlorite solution to destroy cyanide wastes by oxidation of cyanates because highly toxic cyanogen chloride may be formed.
- The reaction proceeds readily, even at high pH, but the secondary oxidation of cyanate to nitrogen and carbon dioxide is very pH dependent. At pH 11 it is slow but runs-away at pH 10-10.3. This procedure should avoid high pHs, excess of hypochlorite, and moderate or high concentrations of the hypochlorite.
- Addition of 0.5 ml of cyanide solution to 5 ml of stirred hypochlorite destroyed a gas meter with the violent evolution of gas.

BRETHERICK L.: Handbook of Reactive Chemical Hazards

CAUTION: Concentrated hypochlorite should not be mixed with concentrated cyanide solutions or solid cyanide because highly toxic cyanogen chloride gas will be released.

Waste solutions may also be reacted with ferrous sulfate to form relatively non-toxic ferrocyanide.

- Recycle wherever possible or consult manufacturer for recycling options.
- Consult State Land Waste Management Authority for disposal.
- Bury residue in an authorised landfill.
- Recycle containers if possible, or dispose of in an authorised landfill.

Section 14 - TRANSPORTATION INFORMATION



DOT:			
Symbols:	None	Hazard class or Division:	6.1
Identification Numbers:	UN3283	PG:	II
Label Codes:	6.1	Special provisions:	IB8, IP2, IP4, T3, TP33

Packaging: Exceptions:	153	Packaging: Non-bulk:	212
Packaging: Exceptions:	153	Quantity limitations: Passenger aircraft/rail:	25 kg
Quantity Limitations: Cargo aircraft only:	100 kg	Vessel stowage: Location:	В
Vessel stowage: Other:	None		
Hazardous materials descrip Selenium compound, solid, Air Transport IATA:	otions and proper shipping na n.o.s.	ames:	
ICAO/IATA Class:	6.1	ICAO/IATA Subrisk:	None
UN/ID Number:	3283	Packing Group:	II
Special provisions:	A3		
Cargo Only			
Packing Instructions:	676	Maximum Qty/Pack:	100 kg
Passenger and Cargo		Passenger and Cargo	
Packing Instructions:	669	Maximum Qty/Pack:	25 kg
Passenger and Cargo Limited Quantity		Passenger and Cargo Limited Quantity	
Packing Instructions:	Y644	Maximum Qty/Pack:	1 kg
Shipping name:SELENIUM Maritime Transport IMDG:	COMPOUND, SOLID, N.O.S	6.(contains potassium seleno	cyanate)
IMDG Class:	6.1	IMDG Subrisk:	None
UN Number:	3283	Packing Group:	II
EMS Number:	F-A,S-A	Special provisions:	274
Limited Quantities: Shipping name:SELENIUM	500 g COMPOUND, SOLID, N.O.S	Marine Pollutant: 6.(contains potassium seleno	Yes cvanate)

Shipping name:SELENIUM COMPOUND, SOLID, N.O.S.(contains potassium selenocyanate)

Section 15 - REGULATORY INFORMATION

potassium selenocyanate (CAS: 3425-46-5) is found on the following regulatory lists; "Canada Domestic Substances List (DSL)","US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory"

Section 16 - OTHER INFORMATION

LIMITED EVIDENCE

May produce skin discomfort*.

* (limited evidence).

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The (M)SDS is a Hazard Communication tool and should be used to assist in the Risk Assessment. Many

factors determine whether the reported Hazards are Risks in the workplace or other settings.

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